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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/705,454	11/10/2003	William Silver	C97-050 CON5	6691
23459	7590	11/12/2004	EXAMINER	
ARTHUR J. O'DEA LEGAL DEPARTMENT COGNEX CORPORATION ONE VISION DRIVE NATICK, MA 01760-2077			MARIAM, DANIEL G	
			ART UNIT	PAPER NUMBER
			2621	

DATE MAILED: 11/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/705,454

Applicant(s)

SILVER ET AL.

Examiner

DANIEL G MARIAM

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 121-167 (renumbered as 122-168) is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 122-168 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

DETAILED ACTION

Specification

1. In page 2 of the amendment to the specification, under the heading "Cross Reference to Related Applications", U.S. Patent Application Serial Number 09/979,588 which is not a correct Application number. Appropriate correction is required.

Original Claims

2. While applicants have canceled claims 1-120 of the originally filed claims by the amendment (See page 3 of the amendment), and have submitted newly added claims 121-167 (See pages 3-7 of the amendment), the originally filed claims in fact contain claims 1-121. Applicant should cancel originally filed claims 1-121.

Claim Objections

3. Claims 152-155 directly or indirectly depends on claim 151. Claims 152-155 are not examined because of the impermissible dependency recited in claim 151. Claim 151 is objected to because it depends on itself. A claim that depends on itself is not permissible. Dependent claim 151 should refer to a preceding claim. A similar dependency also occurs in claims 154 and 161. Appropriate correction is required.

4. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claims 121-167 have been renumbered 122-168.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 133, 137-142, and 165 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. While the above-identified claims recite the limitation “universal code, common code, and group consisting of *care* and don’t care” respectively, the specification says nothing about theses limitations.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claim 122 recites the limitation "the expected shape" in line 4. A similar limitation also occurs in claim 157. There is insufficient antecedent basis for this limitation in the claims.

Since claims 123-156 and 158-168 directly or indirectly depend on claims 122 and 157 respectively, they are also rejected under 35 U.S.C. 112, second paragraph, for the same reason set forth above for claims 122 and 157.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless —

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 122-123, 125, and 149-150 and are rejected under 35 U.S.C. 102(b) as being anticipated by Gee, et al. (5,459,636).

With regard to claim 122, a model pattern representing a training image of an object, the model pattern for use in geometric pattern matching with a run-time, i.e., target image, image having image boundary points (See for example, col. 1, lines 40-60), the model pattern comprising: a geometric description of the expected shape of the object, i.e., vehicle, the geometric description including a plurality of pattern boundary points, i.e., data points located along the edges of the model, in the training image of the object (See for example, item 12, in Fig. 1b); and a plurality of field elements, i.e., size, shape, distance, etc, disposed within a region of the training image that includes the boundary points (See for example, col. 3, lines 37-53).

With regard to claim 123, wherein each field element comprises: a vector indicating distance and direction to a nearest boundary point along a pattern boundary that includes at least some of the boundary points (See col. 4, lines 14-28).

With regard to claim 125, the model pattern of claim 123, each field element further comprising: a gradient direction at the nearest boundary point (See Figs. 8a-8d).

With regard to claim 149, the model pattern of claim 122, wherein each field element

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comprises: information that is stored as a function of position (See for example, col. 3, lines 49-65).

With regard to claim 150, the model pattern of claim 149, wherein the information is stored as a function of real-valued position, i.e., pose volume: six dimensional and/or two dimensional, within the region of the training image that includes the boundary points (See col. 3, lines 49-66).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claim 148 and 151 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gee, et al. (5,459,636) in view of (5,550,937).

With regard to claim 148, Gee, et al. (hereinafter "Gee") discloses all of the claimed subject matter as noted above in paragraph 10, and incorporated herein by reference. While the system of Gee arranges the elements in two dimensional as shown in Fig. 1, Gee does not expressly call for arranging the field elements as a regular array having a *grid spacing* similar to the *grid spacing* of the run-time image. However, Bell, et al (Figs. 4 and 5) teaches this feature. It would have been obvious to one having ordinary skill in the art to incorporate the grid arrangement taught by Bell, et al into the system of Gee, if for no other reason than to arrange the elements of the model and target images using grid points, and to do would at least improve the recognition process.

With regard to claim 151, claim 148 encompasses the limitation of this claim, and thus argument similar to that presented above for claim 148 is equally applicable to claim 151.

13. Claims 157 and 164 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gee, et al. (5,459,636).

With regard to claim 157, Gee discloses a model pattern representing a training image of an object, the model pattern for use in geometric pattern matching with a run-time, i.e., target image, image having image boundary points (See for example, col. 1, lines 40-60), the model pattern comprising: a geometric description of the expected shape of the object, i.e., vehicle, the geometric description including a plurality of pattern boundary points, i.e., data points located along the edges of the model, in the training image of the object (See for example, item 12, in Fig. 1b); a plurality of zones (given the broadest reasonable interpretation, this feature reads on the separation of each edge/boundary point at each location along the contour by blank spaces, and the creation/calculation of vector components between each point) each zone being characterized by an (evaluation code) for determining how an image boundary point within the zone is to be evaluated (col. 4, lines 11-31 and 57-67). Gee meets the limitations of claim 157 except that it characterizes each one of the separated points by a vector component rather than an evaluation code in order to compute the edge points. However, because these two elements are functionally equivalent, one of ordinary skill in the art would have found it obvious to substitute the vector component for the evaluation code, since the objective is to estimate, calculate or evaluate the image edge point.

With regard to claim 164, the model pattern of claim 157, wherein each zone includes at least one field element, i.e., distance, that includes the evaluation code (See col. 4, lines 57-67).

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Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent Number: 5544254, 5555320, 6026186, 6128405, and 6226418; a publication to Gorman discloses "Recognition of incomplete polygonal objects"; and Hügli, et al. discloses "Geometric matching of 3D objects assessing the range of successful initial configurations".

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL G MARIAM whose telephone number is 703-305-4010. The examiner can normally be reached on M-F (7:00-4:30) FIRST FRIDAY OFF.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, LEO BOUDREAU can be reached on 703-305-4607. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


DANIEL MIRIAM
PRIMARY EXAMINER

November 4, 2004